

REMARKS

In the Final Office Action of February 22, 2005, the Examiner rejected claims 48-98 under several references that will be individually discussed in the sections below. Reconsideration of the application in view of the amendments is respectfully requested.

Section 112 Rejections

The Office rejected claim 96 as failing to comply with the written description requirement. The Office states that there is no support for claim 96. Applicants respectfully traverse this rejection. Claim 96 states, *inter alia*, that the "first solar cell and said bypass diode are substantially simultaneously formed in the same process." Support for this limitation can be found, *inter alia*, in Figures 3-5 and the text describing those figures (from page 5, line 27 through page 8, line 4.) As disclosed in those figures, first the structure as a whole is made. Then the structure is etched to form the diode structure separate from the solar cell. Therefore, it can be seen that the solar cell and the bypass diode are formed in the same process. Applicants respectfully request the removal of this rejection.

The Office rejected claims 55-59, 62-64, and 96 under 35 U.S.C. § 112, second paragraph for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants assert that claims 55-59, 62-64, and 96, as amended, satisfy all the requirements of 35 U.S.C. § 112, second paragraph.

Section 102 Rejections

The Office rejected claims 48-66, 68-70, 72-73, 75-78, 80, 84, 86-90, and 92-98 under 35 U.S.C. § 102(b) as being anticipated by JP '397. Applicants respectfully traverse this rejection.

The Office asserts that JP '397 discloses an integral diode because it discloses a common layer between a solar cell and a bypass diode. Independent claims 65, 68, 77, and 88 each recite that the bypass diode and solar cell have sequences of layers that correspond with each other. In other words, the bypass diode and solar cell have identical sequences of layers with substantially the same thickness. In contrast, the diode in JP '397 does not share the same structure as the solar cell. For example, in Figure 2 of JP '397, the solar cell comprises elements 207, 206B, 205B, 204B, 206A, 205A, and 204A. The bypass diode comprises elements 209, 210, 208D, 207D, 204B, and 205A. The only common layers are 205A and 204B. The bypass diode contains several layers not contained in the solar cell (209, 210, 208D, and 207D). And the solar cell contains several layers not contained in the bypass diode (207, 206B, 205B, 206A, and 204A).

Applicants have amended independent claims 48, 52, 57, 60, 65, 68, 77, 88 and 93 to further clarify the structure of the bypass diode and the solar cell.

Applicants assert that, because all of the independent claims are distinct from the JP '397 reference, all of the pending claims (48-98) are allowable over JP '397 and respectfully request the removal of this rejection.

The Office rejected claims 48-66, 68-70, 72, 73-78, 80, 84-90, and 92-98 under 35 U.S.C. § 102(b) as being anticipated by Taylor, GB 2346010A. Applicants respectfully traverse this rejection.

The Office stated that Figures 1C and 1D and pages 5 and 6 of Taylor set forth the features of the instant solar cell semiconductor device. Applicants previously argued that the protection diode of Taylor does not appear to be electrically connected to the solar cell. The Office did not find those arguments persuasive. In the February 22, 2005 Office Action, the Office stated Taylor's diode 11 is integral "because it shares a common layer with solar cell 5." Applicants respectfully disagree with this analysis.

As stated at page 2, line 7 of the application as filed, "Another conventional method to provide bypass diode protection to a solar cell array has been to connect a bypass diode between adjacent cells, with the anode of the bypass diode connected to one cell and the cathode of the diode connected to an adjoining cell." That description applies to Taylor.

As seen in Figures 4A and 4B, Taylor relies on an *external* connection from a diode to a separate solar cell. For example, Figures 4A and 4B show solar cell C2 connected to the diode at P1 and solar cell C3 connected to the diode at P2. In contrast, the present invention discloses an *internal connection* between the diode and the solar cell, as explained at page 7, line 33 through page 8, line 2: "Completion of the bypass diode circuit requires a soldered or welded interconnect made between contacts 109 and 110. This can be done as part of the usual interconnect weld."

Applicants assert that the present invention discloses an *integral* bypass diode in which the bypass diode is connected to the solar cell *without* any connection to other solar cells or bypass diodes.

Applicants therefore assert that all of the pending claims are distinct from the Taylor reference and respectfully request the removal of this rejection.

The Office rejected claims 48-59 and 65-92 under 35 U.S.C. § 102(b) as being anticipated by Ho et al., WO 99/62125. The Office asserts that Figure 14B "has the instant multijunction solar cell." Applicants previously argued that diode layers 1412-1420 lie over the layers of the first subcell, so the diode is not integral to the first subcell. The Office rejected this argument, stating that claim 48 is indefinite as to where the "first subcell" is located. Applicants respectfully disagree. Claim 48 recites that the second subcell "overlies" the first subcell. Therefore, the first subcell is the "bottom" subcell. Ho discloses a diode that is not integral to the bottom subcell. Therefore, Applicants assert that Ho does not anticipate claim 48.

With respect to claim 52, the Office stated that the bottom subcell is layers 1412 to 1416. Applicants disagree. Figure 15 clearly shows that the bottom subcell is below the tunnel diode. With respect to Figure 14B, that means the bottom subcell is layers 1404 and 1402. The diode is not integral with layers 1404 and 1402 in that the diode shares no common layers with 1404 and 1402. Therefore, Applicants assert that Ho does not anticipate claim 52.

With respect to claim 57, the Office stated that the term "electrically connected" in claim 57 does not require direct electrical connection. Applicants have amended that term of claim 57 to read "directly electrically connected." In addition, claim 57 has been amended to

more clearly define which subcell is to be considered the "first" subcell. Therefore, Applicants assert that Ho does not anticipate claim 57.

With respect to claim 60, Applicants previously argued that C-clamp 1442 is not a "metal layer." The Office rejected this assertion, stating, without explanation, that C-clamp 1442 is a metal layer. Applicants re-iterate its argument that C-clamp 1442 is not a layer. C-clamp 1442 is described in Ho as an "interconnect" (page 8, line 20). Moreover, as illustrated in Figure 14B, C-clamp 1442 is external to structure 1400 in that it is not formed or assembled in the same manner as layers 1402 through 1432. Therefore, Applicants assert that Ho fails to describe a metal layer.

Applicants therefore assert that all of the pending claims are distinct from the Ho reference and respectfully request the removal of this rejection.

Section 103 Rejections

The Office rejected claims 48-98 under 35 U.S.C. § 103(a) as being unpatentable over Taylor in view of Marvin et al., and Lillington et al., U.S. Patent 5,853,497. For the reasons set forth above with respect to Taylor, Applicants assert that Taylor fails to anticipate or render unpatentable any of the claims in the present invention. Applicants respectfully requests the removal of this rejection.

The Office rejected claims 48-98 under 35 U.S.C. § 103(a) as being unpatentable over Ho et al., WO 99/62125. For the reasons set forth above with respect to Ho, Applicants assert that Ho fails to anticipate or render unpatentable any of the claims in the present invention. Applicants respectfully requests the removal of this rejection.

Double Patenting

The Office rejected claims 48-98 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over U.S. Patents 6,680,432; 6,278,054; and 6,600,100; and applications 10/280,593; 10/336,247; and 10/773,343. Applicants note that patent application 10/280,593 has issued as U.S. Patent 6,864,414.

Applicants file herewith the appropriate terminal disclaimers to obviate the double patenting rejections.

CONCLUSION

Applicants assert that all of the claims in the present application are allowable over the cited references. If there are any additional charges concerning this response, please charge to White & Case LLP Deposit Account 23-1703.

A favorable consideration of the present amendment together with the original application is respectfully requested.

Respectfully submitted,

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